of a cylinder 8 inches in diameter and 38 inches deep, shown in Figure 2. Linen cloth forms the bottom of the cylinder, and a 12-inch funnel collector is fitted at the top. Special precautions are taken in mounting the gauge solidly to eliminate vibration.

It is found that this form of balance properly adjusted responds readily to the impact of water from the funnel, and with a battery of 3.5 volts one action of the magnet on a chronographic register is effected by each drop from the funnel irrespective of whether the pan is weighted with water or dry. The balance is durable and retains its adjustment well.

Both times and amounts of rainfall are recorded on a single sheet. It is of interest to note that only a slight interval correction needs to be applied to the beginnings of rain and that the drainage from the funnel, or from any funnel, lasts several minutes and continues to close the circuit considerably after the end of rain. Dripping fog or dew also records, but the checks therefrom are quite characteristic and can not be confused. Of the many scores of records obtained from the Duluth instrument rain invariably made the checks close enough to coalesce, and no very heavy dripping fog has been known to bring them closer together than a minute, or nearly a minute. The fog record is also readily distinguished from funnel drainage, the checks from funnel drainage gradually getting farther apart.

The critical part of a timer is the funnel. Many experiments have been made with various coatings and materials, but the best so far found is the plain weathered zinc or copper surface, which starts the drops down by capillarity. The threshold value of such a surface is small, and our experience has been that a timer so equipped picks up the time somewhat better than an observer under average conditions during the day and preeminently better during the night. No timer, however ingenious, can equal the alert human eye; the best that can be hoped for is an instrument that will not fail to record on all precipitation greater than a very small and perhaps negligible trace.

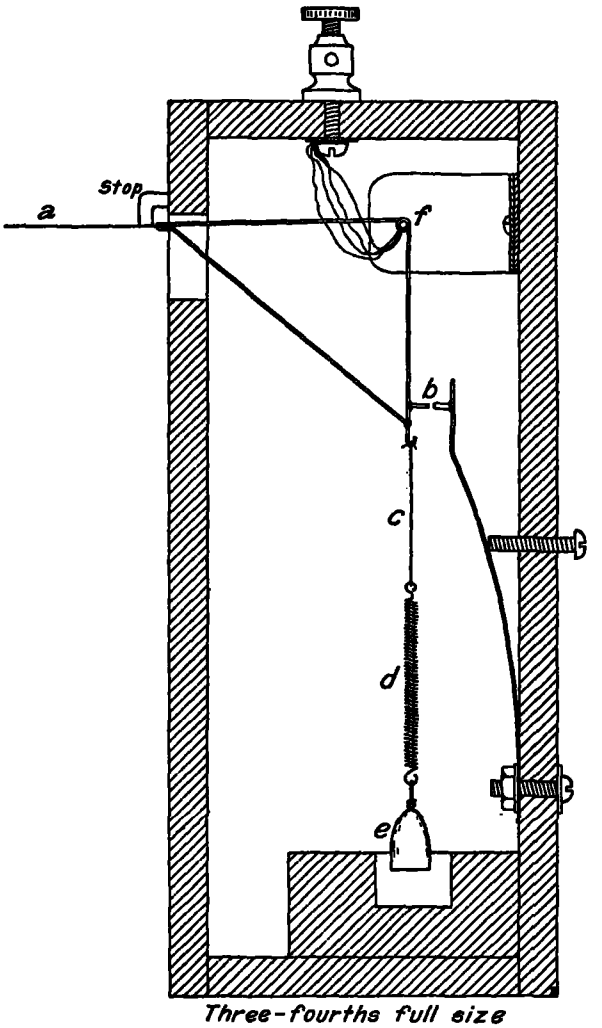

Fig. 1.—Details of the Hibbard rain timer

NOTES, ABSTRACTS, AND REVIEWS

A WATERSPOUT IN LATITUDE 53° N.

The reproductions on the opposite page are from a small photograph sent us by Mr. Thomas Nunns, of New Westminster, British Columbia. The waterspout occurred at Jackfish Lake, which lies about 8 miles west of North Battleford, Saskatchewan, on July 20, 1923. Mr. Nunn's notes accompanying the photograph are as follows:

Jackfish Lake, about 15 by 7 miles. Waterspout traveled about 14 miles.
Direction, from NW. to SE. across lake, appearing from a wheat field.
Direction from camera, almost direct east.
Approximate distance from camera, about 1 mile.
Waterspout stopped at SE. corner of lake near small island. Caused quite high wave; about 4 feet. Weather very hot and sultry. Two terrific thunderbolts preceded it.

NOTE.—The small picture of the original print, unretouched and on the same scale, is presented to show by comparison the extent to which retouching to remove blemishes has altered the appearance of the waterspout.—*B. M. V.*

DOUBLE ANTISOLAR CORONA BY REFLECTED SUNLIGHT

A double solar corona is not often observed; neither is a corona caused by fog about a reflection of the sun. A specter of the Brocken, or antisolar corona, is apparently more rare. And until I saw a double solar corona about the antisolar point of reflected sunlight I did not know of the existence of such a phenomenon. Yet, once seen, it is quite apparent that such an occurrence is natural when there is bright sunshine, with a calm lake, and a low cloud, in the proper positions.

From about 6:05 to 6:20 a. m. (eastern standard time), September 18, 1925, at Silver Lake, N. H., these conditions existed. A low bank of strato-cumulus cloud was forming over a hill about half a kilometer west, and on this cloud was both direct and reflected sunlight. The silhouette of the hilly west shore of the lake with its pointed pine trees was easily recognizable from a house roof 60 meters above and 300 meters west of the lake. Spanning a point about 18° above my shadow on the trees near by, there appeared the double antisolar corona. Its aspect was like that of a small, hazy double rainbow, with a light area of reddish tinge at the center. To the inner red arc the radius was approximately 5° and to the outer about 8°, as roughly measured with forefinger held at arm's length. At the same time, single and double coronal arcs of about the same size were occasionally visible in the fleeting low clouds passing over the sun. The phenomenon ceased when these clouds in the east became too dense, and did not reappear when the sun shone again, for in the meantime the lake had become rippled again, with the south wind.—*Charles F. Brooks (Clark University), Silver Lake, N. H., September 18, 1925.*

(To face p. 399)

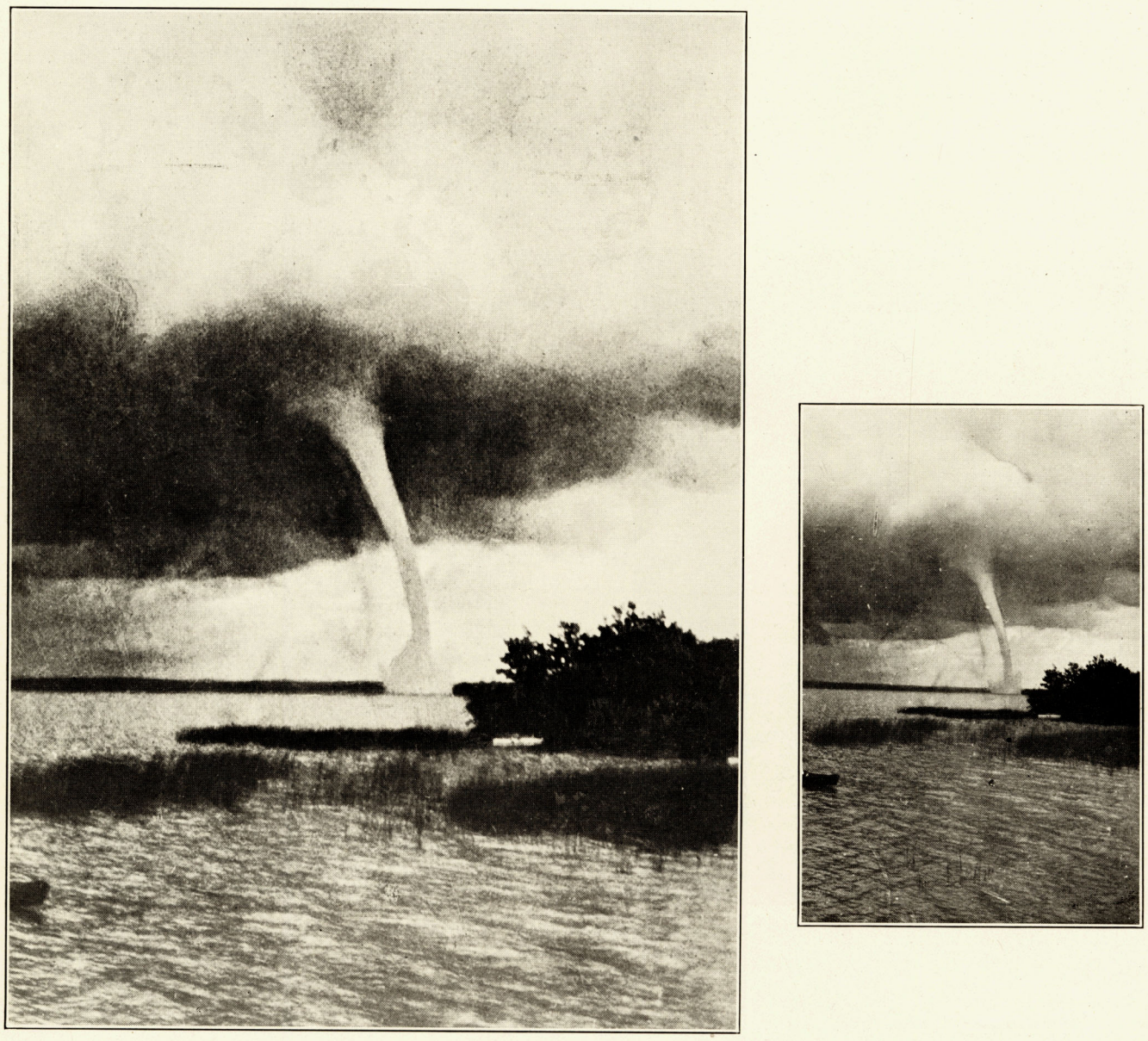

FIG. 1.—Waterspout on Jackfish Lake, near North Battleford, Saskatchewan, July 20, 1923